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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/757,119	01/14/2004	Xiaoming Wu	PRMSP0300US	2966

7590 07/08/2005

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EXAMINER

ASHTON, ROSEMARY E

ART UNIT	PAPER NUMBER
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1752

DATE MAILED: 07/08/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/757,119

Applicant(s)

WU ET AL.

Examiner

Rosemary E. Ashton

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 April 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☐ Claim(s) _____ is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,4-10,12-21 and 24-26 is/are rejected.
- 7) ☒ Claim(s) 2,3,11,22,23 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 4/14/05 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

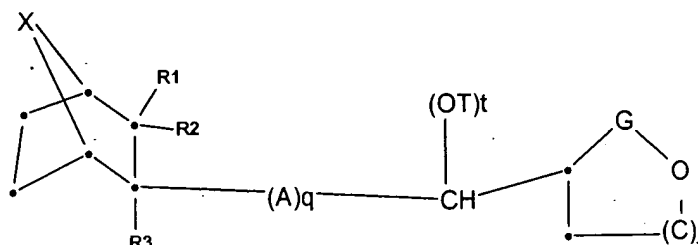
- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 2/11/04.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION***Election/Restrictions***

1. Applicant's election without traverse of the species below in the reply filed on 18 April 2005 is acknowledged.

Applicant claims the elected species below for examination with the following functional groups.

X = CH₂; n=0; R₁-R₃=H; R₄ is the structure have A to the cyclic structure including G; q=0; T=Si(CH₃)₃; t=1; G=SO₂; j=1. The elected species has a norbornene ring.

***Search of Elected Species***

2. As required the examiner searched the elected species in the Chemical Abstracts Registry file.

With n=0 and q=0 the norbornene formula was searched with no A group and G=SO₂ and T= Si(C₁-C₄ alkyl)₃. No art was found for the elected species. The examiner then searched additional compounds

having j=2, followed by G=C(O) with j=1 or 2 and found no art for the compounds below. The following 4 compounds are allowable and thus polymers having the compounds are also allowable. *and photoresists having the polymer*

X	n	R ₁ -R ₃	q	T	t	G	j
CH ₂	0	H	0	Si(C ₁ -C ₄ alkyl) ₃	1	SO ₂	1
"	"	"	"	"	"	"	2
"	"	"	"	"	"	C(O)	1
"	"	"	"	"	"	"	2

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The examiner then searched T=H and art of Tachibana et al. was found for the following 4 compounds.

The following 4 compounds are **rejected**.

X	n	R1-R3	q	T	t	G	j
CH2	0	H	0	H	1	C(O)	1
CH2	1	H	0	H	1	C(O)	1
CH2	0	H	0	H	1	C(O)	2
CH2	1	H	0	H	1	C(O)	2

The art of Ravikiran teaches the following compound. The following compound is **rejected**.

CH2	0	H	0	H	1	SO2	2
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For the compound in claim 26 the following compound is **allowable**.

CH2	na	H	na	H	1	SO2	1
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Specification-Abstract

3. Applicant is reminded of the proper content of an Abstract of the Disclosure. In chemical patent abstracts for compounds or compositions, the general nature of the compound or composition should be given as well as its use, e.g., "The compounds are of the class of alkyl benzene sulfonyl ureas, useful as oral anti-diabetics." Exemplification of a species could be illustrative of members of the class. For processes, the type reaction, reagents and process conditions should be stated, generally illustrated by a single example unless variations are necessary.

The claimed compound having the formula in claim 1 is necessary to clarify the invention and the abstract.

Applicant is requested to revise the content of the abstract on a separate sheet to include the formula in claim 1.

Claim Objections

4. Claims 9 and 11 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in

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independent form. Claims 9 and 11 refer to the nomenclature in claim 1 not claim 8 or claim 10, respectively. The examiner has treated claims 9 and 11 as being dependent from claim 1.

Claim Rejections - 35 USC § 102

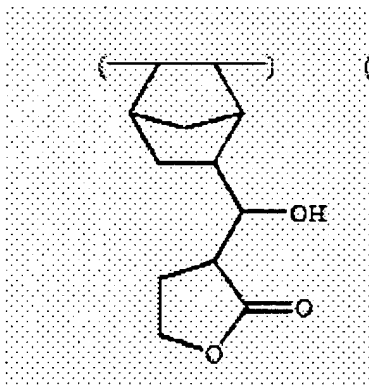
5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

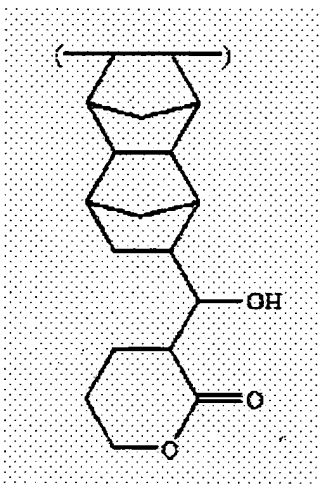
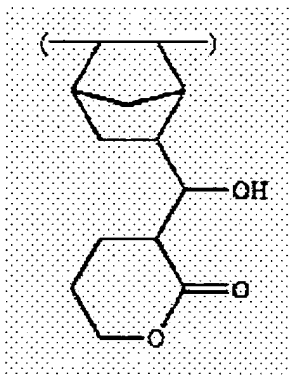
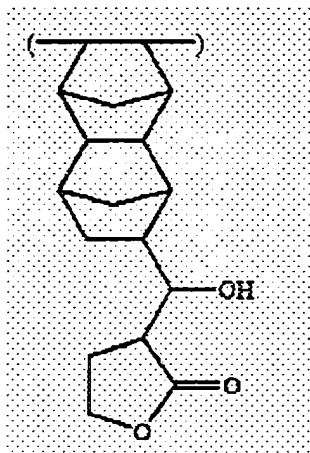
(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 1,6,7,9,13-15,17,18,20,21,24-26 are rejected under 35 U.S.C. 102(b) as being anticipated by Tachibana et al. patent no. 6,660,448. The following compounds are rejected for having $G=C(O)$, $j=1$ or 2, $T=H$, $q=0$, $n=0$ and $X=CH_2$. The compounds below read on claims 1,6 and 21.



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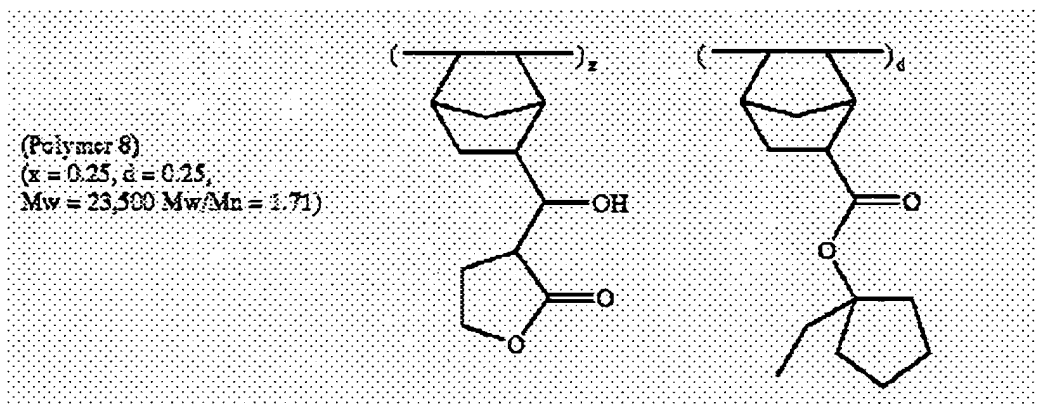


As shown in col. 2, formula 1-1 the compounds may also have a group that is the same as the (A) group in formula I-a in claim 1 of the instant application because as stated in col. 2 for formula (1-2) the group $-(CH_2)_m$ has $m=0-4$.

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Polymer 8, shown below, in Tachibana meets the limitations of claim 7, formula II-a, where X' is CH₂, n'=0, R₅-R₇=H and R₈ is -(CH₂)_bC(O)OR₁₄ and b=0, R₁₄ is a substituted C₅ cycloalkyl group.

Other monomers meeting the limitations of formula II-a are also taught.



As shown in Table 2 (example II-8) Polymer 8 is used in a photoresist composition and col. 63, lines 7-23 the composition is used in a patterning method as claimed in applicant's claims 15 and 18. In col. 51, lines 35-39 Tachibana states the exposure of the photoresist is best suited for 248 or 193 nm thus, while Tachibana exemplifies using 248 nm (KrF excimer laser) one skilled the art envisions using 193 nm as an alternative exposure wavelength as in claims 17 and 20.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 16 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tachibana et al. cited above.

9. Claims 16 and 19 read on exposure of the photoresist at 157 nm which is not specifically taught in Tachibana, however, it would have been obvious to one of ordinary skill in the art to expose at this wavelength with a reasonable expectation of obtaining a photoresist pattern because in col. 51, lines 21-

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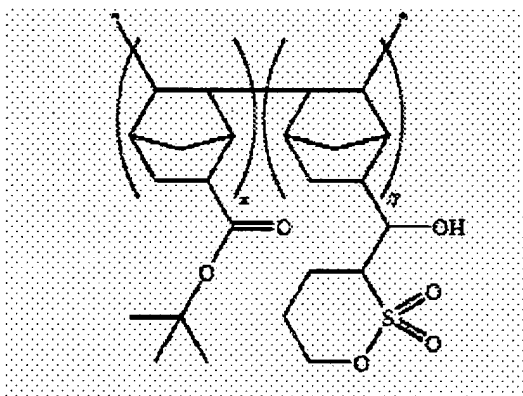
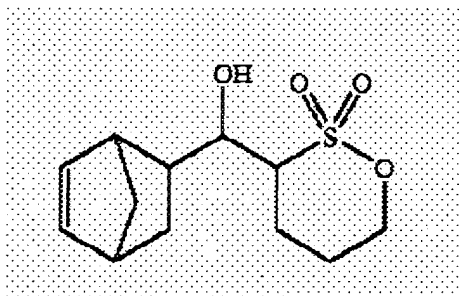
41, Tachibana states the composition may be exposed to extreme UV such as X-rays (about 10 nm) to 248 nm which includes 157 nm. Exposure of photoresists to 157 nm is not novel and, thus, obvious to one of ordinary skill in the art.

Claim Rejections - 35 USC § 102

10. Claims 1,4-10,12,21,24,25,26 are rejected under 35 U.S.C. 102(e) as being anticipated by Ravikiran et al. publication no. US 2005/0019638 A1.

In section 142 Ravikiran teaches a compound meeting the limitations of I-a in claim 1. The compound is also used in a polymer as shown in section 146 and below. In formula (I-a) in claim 1 of the instant application, $X=CH_2$, $n=0$, $q=0$, $T=H$, $t=1$, $G=SO_2$, $j=2$.

(1)



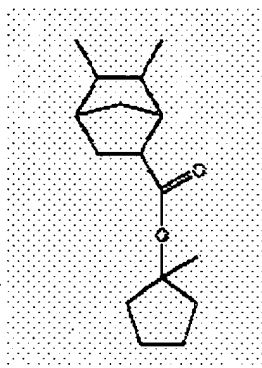
The additional t-butyl monomer in the polymer above meets the limitations of formula II-a in claim 7 when X' is CH_2 , $n'=0$, $R_5-R_7=H$ and R_8 is $-(CH_2)_bC(O)OR_{14}$ and $b=0$, R_{14} is a branched C_4 group.

In sections 22-24, formula II teaches monomers having pendant cyclopentyl or cyclohexyl sulfones bound to the norbornene monomer via $-CH(OH)-$.

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Additional monomers having formula II-a of claim 7 are the same monomers having formula II in section 22 of Ravikiran. The definition for R5-R8 groups in formula II-a has duplicates in formula II definitions for R5-R8. For example in claim 7, formula (II-a), one group for R5-R8 is $-(CH_2)_bC(O)OR_{15}$ wherein R15 is an acid labile group. In section 22 and 23 formula II one group for R5-R8 is $-(CH_2)_bC(O)OR_{10}$ wherein R10 is an acid labile group (section 23, line 12 and section 27, line 5).

Section 141 teaches the limitation of claim 10 wherein R14 is a 1-methylcyclopentane as shown below.



Section 23, line 9 and section 19, line 2, teaches the limitation of claim 12 wherein R8 is $-(CH_2)_bC(CF_3)_2OR_{13}$ where R13 is hydrogen.

The rejected compound in claim 26 is rejected for $G=SO_2$, $T=H$, $t=1$, $j=2$. The compounds having $T=Si(CH_3)_3$ are allowed.

Allowable Subject Matter

11. Claims 2,3,11,22,23 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

12. The following is a statement of reasons for the indication of allowable subject matter: The prior art does not teach the claimed polymers and compounds where $T=Si(CH_3)_3$.

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13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Dean patent no. 4,568,724 teaches ^agamma-sultone ring directly bound to a norbornene ring as shown in col.2. Kinsho et al. patent no. 6,500,961 teaches a compound having a lactone bound to norbornene via a CR'(OR) group. Kinsho et al. patent no. 6,472,543 teaches a compound having a lactone bound to norbornene via a CH2 group. The CH2 group is attached adjacent to the ring oxygen. Maeda et al. publication no. US 2001/0026901 A1 teaches a lactone ring directly bound to a norbornene ring as shown in the abstract.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rosemary E. Ashton whose telephone number is 571-272-1326. The examiner can normally be reached on Mon-Fri, 11:00-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cynthia Kelly can be reached on 571-272-1526. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Rosemary E. Ashton
Primary Examiner
Art Unit 1752

July 5, 2005

**ROSEMARY ASHTON
PRIMARY EXAMINER**